



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/549,743

09/19/2005

Craig N Schubert

62212A

3393

109 7590 03/06/2009

The Dow Chemical Company  
Intellectual Property Section  
P.O. Box 1967  
Midland, MI 48641-1967

EXAMINER

WU, IVES J

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

03/06/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/549,743	<b>Applicant(s)</b> SCHUBERT, CRAIG N	
	<b>Examiner</b> IVES WU	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 19,20 and 23-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19,20 and 23-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

(1). Applicant's election without traverse of Group II, claims 19-20 including species 1,3-dimethyl-3,4,5,6-tetrahydro-2(1H)-pyrimidinone in the reply filed on 1/9/2009;9/15/2008 is acknowledged.

Claims 1-18 are cancelled. Claims 21-22 are withdrawn.

New claims 23-28 are added.

The rejections of claims 19-20, 23-28 are introduced in the following.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

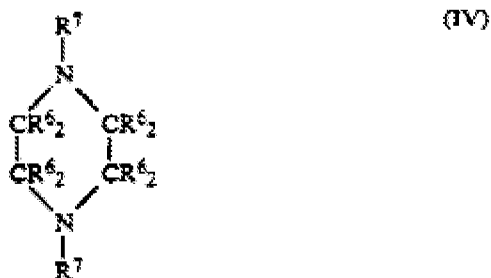
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(2). **Claim 19** is rejected under 35 U.S.C. 102(b) as being anticipated by Bedell (US 5167941A).

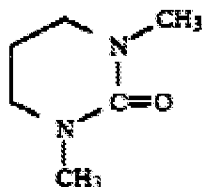
As to a solvent composition for selective removal of COS from a gas stream containing same comprising a) 1,3-dimethyl-3,4,5,6-tetrahydro-2(1H)-pyrimidinone; and b) one piperazine compound of formula (III) in **independent claim 19**, Bedell (US 5167941A) disclose quaternary polyamines as sulfite oxidation inhibitors in amine scrubbing of SO<sub>2</sub> (Title). The scrubbing solutions contain amines such as piperazinones, morpholinones, piperidines, **piperazines**, piperazinediones, hydantoines, trizinones, **pyrimidinones**, oxazolidones, N-carboxymethylethylenediamines, etc. (Abstract, line 8-12). As shown in the following formula (IV) which reads on piperazine compound as is claimed. Formula (VI) of pyrimidinones reads on the 1,3-dimethyl-3,4,5,6-tetrahydro-2(1H)-pyrimidinone as is claimed. The intended use for selective removal of COS from a gas stream must result in a manipulative difference as compared to the prior art. *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458,459 (CCPA 1963).

Art Unit: 1797

Another preferred class of scrubbing amines includes piperazines having carbonyl groups, preferably compounds of the formula:



wherein each of  $R^6$  and  $R^7$  is independently hydrogen; an alkyl group; a hydroxyalkyl group; an aldehyde group; a carboxylic acid or salt group; or an alkyl group containing at least one carboxylic ester, carboxylic acid or salt, ether, aldehyde, ketone or sulfoxide; and wherein at least one  $R^6$  or  $R^7$  is a carbonyl-containing group, such as an aldehyde group, a carboxylic acid containing group, a carboxyl ester group, or a ketone-containing group.



### Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

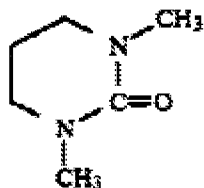
Art Unit: 1797

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(3). **Claims 19-20, 23-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner et al (US 6852144B1) in view of Bedell (US 5167941A).

As to a solvent composition for selective removal of COS from a gas stream containing same comprising a) 1,3-dimethyl-3,4,5,6-tetrahydro-2(1H)-pyrimidinone; and b) at least one alkanolamine compound of formula (II)  $R_3NHR_4OR_6$  **or** at least one piperazine compound of formula (III) in **independent claim 19**, a process for selective removal of COS from a gas stream containing COS and  $CO_2$  process comprising contacting the gas stream with a solvent composition comprising a) 1,3-dimethyl-3,4,5,6-tetrahydro-2(1H)-pyrimidinone; and b) at least one alkanolamine compound of formula (II)  $R_3NHR_4OR_6$  **or** at least one piperazine compound of formula (III) in **independent claim 20**, Wagner et al (US 6852144B1) disclose method for removing COS from a stream of hydrocarbon fluid and wash liquid for use in a method of this type (Title). COS is selectively removed with respect to  $CO_2$  from a hydrocarbonaceous fluid stream which contains  $CO_2$  and COS. The process is carried out by (1) intimately contacting the fluid stream in an absorption or extraction zone with a scrubbing liquor consisting of an aqueous amine solution containing from 1.5 to 5 mol/l of an aliphatic alkanolamine having of from 2 to 12 carbon atoms and from 0.8 to 1.7 mol/l of at least one activator selected from the group consisting of piperazine, methyl piperazine and morpholine (Abstract, line 1-14). The activator is advantageously selected from the group consisting of monoethanolamine (MEA), monomethylethanolamine (MMEA), diethanolamine (DEA), piperazine, methylpiperazine and morpholine (Col. 5, line 32-36). Wagner et al **do not teach** pyrimidinone - 1,3-dimethyl-3,4,5,6-tetrahydro-2(1H)-pyrimidinone as claimed.

However, Bedell (US 5167941A) **teaches** quaternary polyamines as sulfite oxidation inhibitors in amine scrubbing of  $SO_2$  (Title). The scrubbing solutions contain amines such as piperazinones, morpholinones, piperidines, **piperazines**, piperazinediones, hydantoins, trizinones, **pyrimidinones**, oxazolidones, N-carboxymethylethylenediamines, etc. (Abstract, line 8-12). As is shown in the Figure below, it includes 1,3-dimethyl-3,4,5,6-tetrahydro-2(1H)-pyrimidinone.



In view of functionally equivalent amines in scrubbing liquid such as piperazine, 1,3-dimethyl-3,4,5,6-tetrahydro-2(1H)-pyrimidinone disclosed by Bedell and by Applicant, it would have been obvious at time of the invention to replace piperazine of Wagner et al by the 1,3-dimethyl-3,4,5,6-tetrahydro-2(1H)-pyrimidinone disclosed by Bedell in the scrubbing liquor of Wagner et al based on their interchangeability as functional equivalent amines in the scrubbing liquid.

As to component b) being an alkanolamine of formula II in which substituent R<sub>3</sub> is hydrogen in **claims 23** and **26**, component b) being at least one of monoethanolamine, diethanolamine, methylethanolamine, diisopropanolamine, and 2-(2-aminoethoxy)ethanol in **claims 24** and **27**, component b) to be monoethanolamine in **claims 25** and **28**, Wagner et al (US 6852144B1) disclose monoethanolamine (Col. 5, line 34-35).

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IVES WU whose telephone number is (571)272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu

Art Unit: 1797

Date: February 27, 2009

/DUANE SMITH/

Application/Control Number: 10/549,743

Page 6

Art Unit: 1797

Supervisory Patent Examiner, Art Unit 1797